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Principal Components of Life style and Attitude towards Research among Internet-users. A Factor Analytical Study on Higher Education Students

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Abstract:
The objectives of the present study are to find out the dominant set of factors of Internet-users on various domains of Lifestyle and Attitude towards Research. Sample of 300 Internet-user post graduate students were selected through random sampling technique from various departments of three faculties i.e. (faculty of Science, faculty of Social science and faculty of Arts).100 students selected from each of the three faculties of University of Kashmir, (J&K) India. Lifestyle Scale by S. K. Bawa and S. Kaur & Attitude Scale towards Research Scale by Vishal Sood and Y. K. Sharma was used to collect the data. Moreover Information Blank developed by the investigator to ascertain the Internet-users. The obtained data is analyzed by using the Principal Component Factor Analysis (PCFA with SPSS 20). The results indicate the emergence of three factors in case of Internet-users with 74% of the total variation in data. First factor is designated as **"Contemporary Lifestyle with Career and Physical Efficacy".** This is more influential among the Internet-users with high factor loadings. The Second factor is designated as **"Academic Attainment and Research Affinity".** This is the second influential factor. The variables that loaded on the third factor labeled as **"Research Connivance in Routine Life".** This is the least influential factor among Internet-users. It is to be recorded that first and second factor exhibited a greatest variability and last identified factor emerged exhibits low variability among Internet-users.
Keywords: Principal Components, Life style, Attitude, Research, Internet-users, Factor Analytical, Higher Education Students

Introduction

The Internet has experienced vast expansion in recent years, leading to its extensive use by people from all generations. People in different age groups and jobs, students and academicians using the Internet because it is the easiest, fastest, and cheapest ways of accessing necessary information. For a generation of young people, technology has assumed a substantial stake in their social and educational lives. According to Chan & Fang (2007) Internet is used for different purposes by young people such as making friends, shopping, listening to music, having fun, doing homework, and finding information for further education. Internationally, there are many surveys on the use of the Internet, and nearly all find that Internet use is most prevalent amongst younger, more educated people (Hoffman, Novak & Schlosser, 2000). Chen & Fu (2009) Internet searching helps university students to boost their intellectual development and job preparation. Due to the endless nature of information resources on the Internet. Researches indicate that seeking information on the Internet has become the first choice option for many people, especially for students (Cole *et al*., 2000; Lawrence & Giles, 1999). About half of the students begin using computers during their undergraduate years, and nearly two-thirds of them make use of Internet for educational purposes (Usta & Yildirim, 2007). Students accepted that the Internet is more informative, useful, less expensive, time saving .It has made a tremendous impact on the academic activities of the students. Students use the Internet activities (facilities) especially for seeking homework and their projects by using search engines. Glenda *et al*. (2006) some of the most important reasons why students go online include research, school assignments, e-mails and chatting. New times are characterised by new ways of learning, primarily through use of the Internet. The Internet is a relatively new channel for scholarly resources, and contains vast quantities of information that vary a great deal regarding its contents, aim, target group, reliability etc. Hence, it is important that the end-user is aware of the diverse information available on the Internet, and educated in the criteria by which the information content should be assessed (Chapman, 2002).

Information and Communication Technology (ICT) has now broadened the horizon of the opportunities among institutions of higher learning, giving hopes to members of the academic communities to cooperate with their counterparts all over the world (Collis & Wende, 2002; OECD, 2005), and strengthened their mandate of teaching and carrying out research (CHEPS, 2000). Internet use has become a way of life for the majority of higher education students all around the world. It affects the way people learn especially in higher learning institutions (Edmunds & Conole, 2010).Today's students are believed to integrate technology in all aspects of their lives for varied purposes, particularly socializing, entertaining and shopping (Asselin, Moayeri, 2008) as well as doing homework (Lenhart & Hitlin, 2005).Students have easier access to a wider range of material, and can established links between different information in variety of ways.

The significance of present study is the fact that nowadays the Internet is pervasive in the lives of individuals, institutions, and societies all over the world, so in India. The recent decades have witnessed a dramatic increase in the use of the Internet and computer technologies which become a common instrument in our daily living and have a significant influence on quality of life (Israel, 2000). The Internet has been used for last two decades in our society and we have a generation of students, who grew up with the Internet. Since its inception, it is generally acknowledged that its appearance, not only brings convenience to mankind, but also may cause a great deal of potential problems. There is a large body of research spanning several domains, disciplines, and approaches that has investigated' use of technology, but no work has focused on studying the dominance of Internet-users in various factors of lifestyle and attitude towards research in higher education. Therefore, there is a critical need to have standardized and more reliable research in this area as a way of advancing the Internet usage and providing an insight to determine the Lifestyle and attitude towards research among university students.

Objectives of the Study

The following objectives have been formulated for the present investigation:

1. To identify Internet-users.
2. To find out the dominant set of factors of Internet-users on various dimensions Lifestyle and Attitude towards Research.

Hypothesis

Following hypothesis has been framed for the proposed investigation:

1. The dominant set of factors extracted from Internet-users on various dimensions of Lifestyle and Attitude towards Research bear Variance.

Methodology and Procedure

Descriptive study was conducted in University of Kashmir. The study population comprised students from three fields of study namely Sciences, Social sciences and Arts. Random sampling was implemented to find out the dominant set of factors of Internet-users on Lifestyle and Attitude towards Research.

Sample

A sample of 300 post graduate students (Internet-users) were selected through random sampling technique from various departments of three faculties i.e. (from faculty of Science, faculty of Social science and faculty of Arts 100 from each faculty) of University of Kashmir, (J&K) India. It needs to be mentioned that the subjects (Internet-users) reading in 3rd and 4th semester has been considered the sample for the present study.

Collection of data

Tools

1. ***Information Blank:*** Self constructed *Information blank* developed by investigator with the purpose to ascertain the Internet non-users. In the present study ***Internet -users*** are those university students who have direct access to the worldwide network and have their own exposure and skill to use Internet and have minimum of one year's experience of Internet usage.
2. ***Attitude Scale towards Research***: *In the present study, Attitude towards Research refers to the dominant set of scores as measured by Attitude Scale towards Research by Vishal Sood and Y. K. Sharma (ASTR–SVSY).*The scale consists 42 items with Four Dimension-I. General Aspects of Research and Research Process, II. Usefulness of Research in Professional Career, III. Relevance of Research in Personal- Social Life, IV. Difficulties in Research and Research Anxiety.
3. ***Life Style Scale:*** *In the present study, Lifestyle assessed by the dominant set of scores as measured by Lifestyle Scale by S. K. Bawa and S. Kaur (LSS–BK).* This scale consists 60 items (43 positive and 17 negative items) to measure the lifestyle of the students in six different dimensions: I. Health Conscious Life Style, II. Academic Oriented Lifestyle, III. Career Oriented Lifestyle, IV. Socially Oriented Lifestyle, V. Trend Seeking Lifestyle, and VI. Family Oriented Lifestyle.

Statistical analysis and Interpretation:

Keeping in view the objectives of the study, the data obtained was put to suitable statistical analysis by using the Principal Components method of Factor Analysis (PCFA).

Principal component Factor Analysis of Internet-users on various dimensions of Lifestyle and Attitude towards Research

Table.1: KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity (Group Internet- users (N=300)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**.814**
Bartlett's Test of Sphericity	Approx. Chi-Square	1954.802
	df	45
	Sig.	.000

Table: 1 shows the information of two tests that were used to verify if the PCFA employed in testing the hypothesis is appropriate. The two main tests in the table are: a) the KMO and b) Bartlett's Tests. The KMO value (0.814). It shows that the degree of common variance among the variables is quite high. The KMO index ranges from 0 to 1 and the sample can be considered suitable for PCFA if this index is equal or higher than 0.600 in the light of a high significance of the Bartlett's test of Sphericity (Chi-Square=1954.802, p=.000). Therefore, the results presented in the same table reveal that the data used is adequate enough to conduct the Principal Components Factor Analysis (PCFA).

Table No.2: Showing the Total Variance Explained of Internet-users on various dimensions of Lifestyle and Attitude towards Research (N=300)

Variables	Communalities		Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Initial	Extraction	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
HOLS	1.000	.829	4.200	42.003	42.003	4.200	42.003	42.003	3.255	32.547	32.547
AOLS	1.000	.858	2.181	21.815	63.818	2.181	21.815	63.818	3.024	30.239	62.787
COLS	1.000	.842	1.117	11.170	74.988	1.117	11.170	74.988	1.220	12.201	74.988
SOLS	1.000	.825	.949	9.486	84.474						
TOLS	1.000	.853	.551	5.510	89.984						
FOLS	1.000	.472	.337	3.370	93.354						
AGARRP	1.000	.619	.195	1.949	95.304						
AURPC	1.000	.536	.180	1.801	97.104						
ARRPSL	1.000	.865	.155	1.552	98.656						
ADRRA	1.000	.800	.134	1.344	100.000						

Extraction Method: Principal Factor Analysis

The results presented in table: 2 indicated that the 1st part of the table shows communalities which indicate the amount of variance in each variable that is accounted for. Initial communalities have been considered as the estimation of variance in each variable accounted for by all Factors (or components). Extraction communalities indicate the estimation of variance in each variable accounted for by the factors (or components) in the factor solution. The 2nd part of the table shows the *Initial Eigenvalues* and the percentage of variance explained by each successive factor. Table shows the Eigenvalues and the percentage of variance explained just for the three factors of the initial solution that are regarded as important. Third part of the table dealt with the *Extraction of Sums of Squared Loadings* with two important pieces of information. First, in the column marked '% of variance' it shows how much variance is explained by each of the Factors identified (from the greatest amount of variance to the least amount of variance). This Factor analysis is based on three Factors due to greater Eigen values (> 1). It is to be noted that the first factor of the initial solution is much more important than the second and the second is more important than the third. However, in the right side part of the table the Eigenvalues and percentage of variance explained for the two rotated factors are displayed. So, the results in the same table reveals that the first Factor accounts for 42.003% of the variance in the total scenario in a very large amount, while the second Factor identified, accounts for only 21.815% and the third Factor with 11.170 % of the total variance. Each Factor is observed to be unrelated to the other, and the amount of variance in each Factor is also unrelated. The other Factor is independent to each other. It has been observed that how much variance in the total picture is explained by each Factor and which Factors possess the most and least explanatory power to explain the total scenario of 10 variables. Second, SPSS keeps a score of the cumulative amount of explanatory power of the 3 Factors identified. In the column, 'Cumulative %'tells us that in total 74.988% of the total picture (of the 10 variables) are accounted for explained by the 3 Factors identified. On the other hand, 'Rotation of Sums of Squared Loadings' (the fuller power of Factor analysis) is tapped thereby identifying more clearly the groupings of variables into Factors, and separating each Factor from the other much more clearly. With the Rotation of Sums of Squared Loadings, the percentage of variance explained by each Factor is altered, even though the total cumulative percentage 74.988% remains the same. The first Factor in the rotated solution no longer accounts for 42.003% as in the Extraction of Sums of Squared Loadings, but only 32.547% of the variance, and Factor 2, accounted for 21.815% of the variance in the Extraction Sums of Squared Loadings now accounts for 30.239% of the variance in the Rotated Sums of Squared Loadings. Factors 3 accounted for only just 11.170% of the variance in the Extraction Sums of Squared Loadings now accounts for 12.201% of the variance in the Rotated Sums of Squared Loadings. The Factor matrix contains Factor loadings for each variable on each Factor. In computing the un-rotated Factor matrix, the researcher is simply interested in the best linear combination of variables-best in the sense that the particular combination of original variables accounts for more of the variance in the data as a whole than any other linear combination of variables.

Table No.3: Showing the Un-rotated and Rotated Factor Matrix of Internet-users on various dimensions of Lifestyle and Attitude towards Research (N=300)

Variables	Un-rotated Factor Matrix[a]			Variables	Rotated Factor Matrix[a]		
	1	2	3		1	2	3
COLS	.791	.454	.102	TOLS	.906	-.174	.055
TOLS	.785	.487	.022	COLS	.888	-.183	.139
HOLS	.782	.454	.107	HOLS	.882	-.176	.143
ARRPSL	-.747	.549	.066	ADRRA	.853	-.021	-.268
AOLS	-.739	.550	.094	AOLS	-.162	.905	-.117
SOLS	-.730	.539	.033	ARRPSL	-.168	.903	-.145
AURPC	-.491	.452	.301	SOLS	-.163	.877	-.173
ADRRA	.596	.616	-.257	AURPC	-.045	.717	.139
AGARRP	.335	-.064	.709	AGARRP	.208	-.105	.752
FOLS	.037	-.221	.649	FOLS	-.118	-.031	.676

Extraction Method: Principal Factor Analysis. 3 Factors extracted. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 4 iterations

The table: 3 further show the Factor loading/correlations for a rotated Factor solution. Comparing the graphs for the rotated and un-rotated solutions, it can be seen that the proximity of the points representing the variables to the axes (and the frame) have changed. This change was brought about by rotating the whole frame, including the axes, in a counter clockwise direction. In this case, the Varimax method was used; for each variable, this leads to maximize the loading on one Factor and to minimize the loadings on the other Factors. The Principal Components Factor Analysis (PCFA) was used as the extraction technique and Varimax was used as a method of rotation. Investigator took the threshold value of 0.600 for factor loading criterion. The table further shows the result of the extracted Factors. Loadings indicate the degree of correspondence between the variable and the Factor, with higher loadings making the variable representative of the Factor. Other variables from the list are some numerical distance away from the variables selected and also seem to be conceptually unrelated to the seven variables identified for inclusion in the Factor. The variables selected are high, close to each other and distant from the other variables. This distinguishes more clearly one Factor from another than the Extracted Sums of Squared Loadings. Rotation is undertaken on the basis of *Varimax rotation*. This maximizes the variance between Factors and hence helps to distinguish them from each other. In SPSS the rotation is called *orthogonal* because the Factors are unrelated to, and independent of, each other. Further analysis presented shows the loadings of the ten variables on the three Factors extracted. The higher the absolute value of the loading, the more the Factor contributes to the variable.

Table.4: Showing the Rotated Factor Matrix with Blocked out Values (Extraction Method) of Internet-users on various dimensions of Lifestyle and Attitude towards Research (N=300)

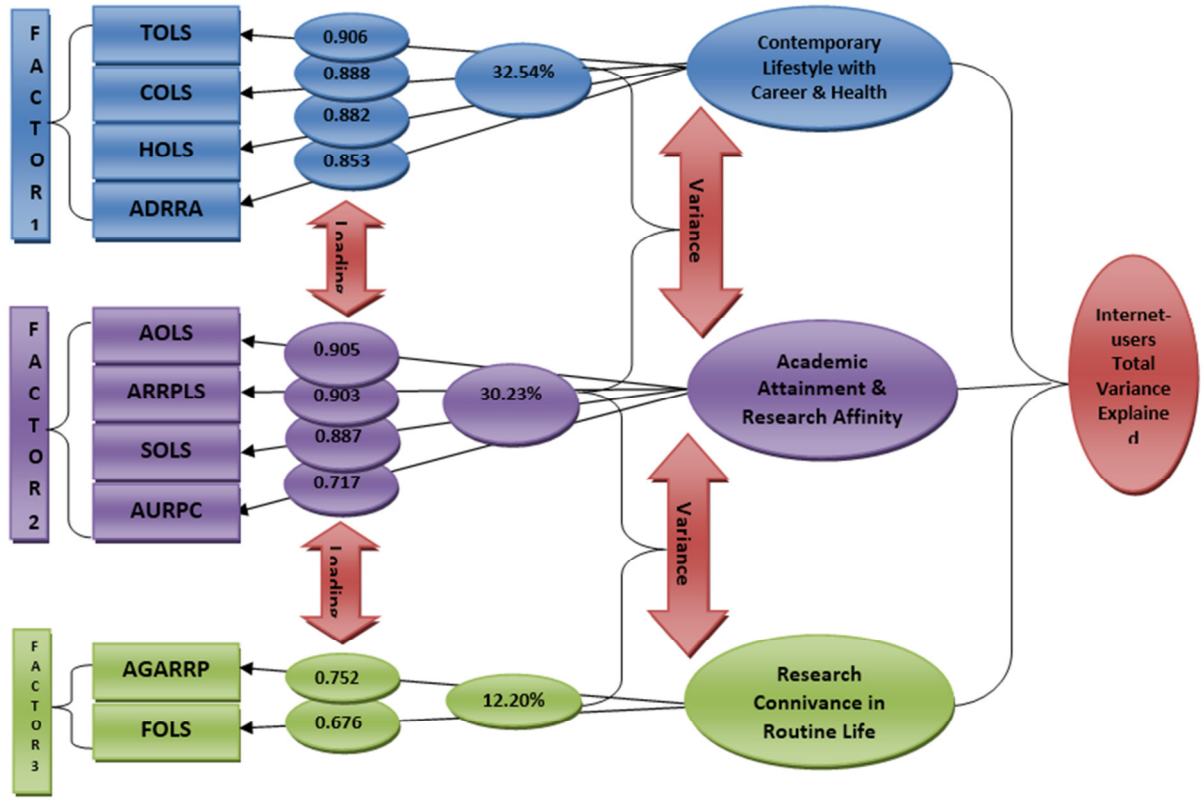
Variables	Rotated Factor Matrix[a]		
	1	2	3
TOLS	.906		
COLS	.888		
HOLS	.882		
ADRRA	.853		
AOLS		.905	
ARRPSL		.903	
SOLS		.877	
AURPC		.717	
AGARRP			.752
FOLS			.676

Extraction Method: Principal Factor Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations

The gaps on the table: 4 represent loadings that are less than 0.600, this makes reading the table easier. Here the investigator suppressed all loadings less than 0.600 with the help of default setting SPSS to use the Kaiser stopping criterion (i.e., all Factors with Eigenvalues greater than 1) to decide how many Factors to extract. Analysis yielded a three-Factor solution with a simple structure (Factor loadings =>.600). This implies that there are three substantively meaningful uncorrelated pattern of relationship among the variables. For the first factor three variables that loaded significantly high on this factor i.e. Trend seeking lifestyle (TOLS), Career oriented lifestyle (COLS), Health conscious lifestyle (HOLS) and Attitude towards difficulties in research and research anxiety (ADRRA) with factor loadings of 0.906, 0.888, 0.882 and 0.853 respectively. The variables that load

significantly high on the second factor are mostly the variables that deal with Academic oriented lifestyle (AOLS), Attitude towards relevance of research in personal and social life (ARRPSL), Social oriented lifestyle (SOLS) and Attitude towards usefulness of research in professional career (AURPC) with factor loadings of 0.905, 0.903, 0.877 and 0.717 respectively. There are only two variables that loaded significantly high on the third factor i.e. Attitude towards general aspects of research and research process (AGARRP) and Family oriented lifestyle (FOLS) with factor loadings of 0.717 and 0.676 respectively.

Fig. No.1: Showing the Results of the Total Variance Explained by the extracted Factors and the Analysis of each of the 3 Factors Clusters of Variables Proffers a recipe for Naming the Factors of Internet-users (N=300)



Acronyms:

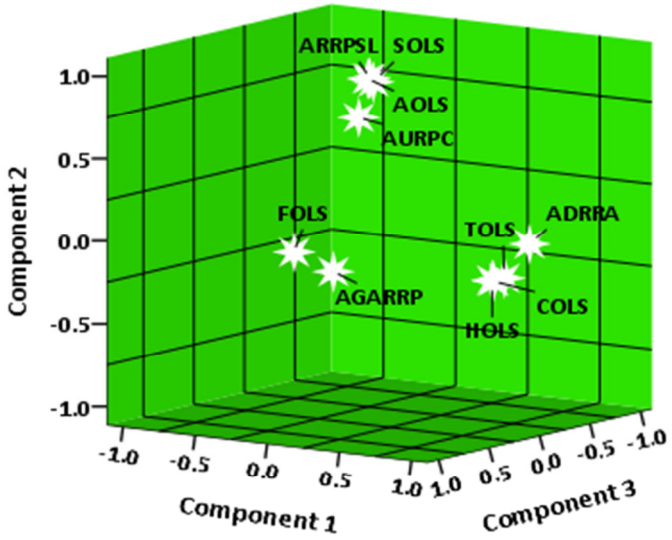
*(1)**HOLS**= Health Oriented Lifestyle. (2) **AOLS**=Academic Oriented Lifestyle.(3) **COLS**=Career Oriented Lifestyle. (4) **SOLS**=Social Oriented lifestyle. (5) **TOLS**=Trend Oriented lifestyle. (6) **FOLS**=Family Oriented lifestyle.(7)**AGARRP**=Attitude towards General Aspects of Research and Research Process.(8) **AURPC**=Attitude towards Usefulness of Research in Professional career. (9) **ARRPSL**=Attitude towards Relevance of Research in Personal and Social Life. (10) **ADRRA**=Attitude towards Difficulties in Research and Research Anxiety*

The above figure explained the analysis of Internet-users (University students) created 3 Factors that included 10 types of information. The result shows these groups by such names which Investigator assigned as well as the types of information in each group. Rotated Matrix of three Factors (clustering of items) shows the Factor loadings and percentage of variation for each variable and highlighted the Factor that each variable loaded most strongly. Factor 1 accounted for 32.54% of the variance. It has been found that four variables loaded strongly on Factor 1 and generated 90.6% of the variation in Trend Seeking lifestyle with Factor loading 0.906. The data further depicts that 88.8% of variation in Career Oriented Lifestyle with Factor loading 0.888. Further, 88.2% of variation in Health Conscious Lifestyle with Factor loading 0.882 and 85.3% of variation in Attitude towards Difficulties in Research and Research Anxiety with Factor loading 0.853 was observed. Each of the variables that loaded on this Factor has shown a correlation (r): $0.853 \leq r \leq 0.906$ with the Factor. The researcher devised the name of this Factor as ***"Contemporary Lifestyle with Career & Health & Preferences."*** Factor 2 accounted for 32.54% of the variance. It was observed that four variables also loaded strongly on this factor which generated 90.5% of the variation in Academic Oriented Lifestyle with Factor loading 0.905. The 90.3% of variation in Attitude towards Relevance of Research in Personal and Social Life with Factor loading 0.903 was also reported. It was also observed that 87.7% of variation in Social Oriented lifestyle with Factor loading 0.877 and 71.7 of variation in attitude towards usefulness of research in professional career with Factor loading 0.717. Each of the variables that loaded on this Factor has a correlation (r): $0.717 \leq r \leq 0.905$ with the Factor. The

researcher devised the name of this Factor as ***"Academic Attainment and Research Affinity."*** However, Factor 3 accounted for 12.20 % of the variance. The variables that load significantly high on this Factor generated 75.2 % of variation in Attitude towards General Aspects of Research and Research Process with Factor loading 0.752 and 67.6 % of variation in Family Oriented Lifestyle (Factor loading 0.676). It has correlation (r): $0.676 \leq r \leq 0.752$ with the variables that loaded on it. The researcher devised the name of this Factor as: ***"Research Convenience in Routine Life."*** Three-dimensional chart that includes not only horizontal and vertical axes but also *depth* by *rotating* the plotted points through 90 degrees, then the effect of this would be to bring closer together those variables that are similar to each other and to separate them more fully in distance from those variables that have no similarity to them, i.e. to render each group of variables (Factors) more homogeneous and to separate more clearly one group of variables (Factor) from another group of variables (Factor). The process of rotation keeps together those variables that are closely interrelated and keeps them apart from those variables that are not closely related.

The below figure Showing a Clear Pattern of the Loadings, with all Variables Identified with 3 Factors of Internet-users**.**

Component Plot in Rotated Space



Discussion and Conclusion:

From the above results, it can be observed that three factors determine the lifestyle and attitude towards research among the Internet-users group. It indicated Internet-users were found much interested to adapt modern lifestyle and have conscious about their health and career interests. It can be inferred that Internet-users update themselves with new trends and are very much eager to opt new ways of life. They used Internet and frequently consult the source which helps them to adopt modern lifestyle. Internet-users use their abilities and preferences with regard to career; they can access Internet sites describing the qualifications, skills, and educational requirements of various careers and can engage in online conversations with professionals to gain insights into the day-to day activities of specific careers. Connecting worldwide sites to get information on specific careers, like prepare for the job, kinds of courses are helpful, and job outlook for the future etc. They match the career information with personal abilities, desires, and values and gain valuable practice in synthesizing the information to formulate a viable career plan. Many career development sites that may visit to learn about careers and also use email to contact experts and professionals around the world to explore more personal aspects of a specific career by the Internet-group of subjects. Internet has been proposed as an effective medium to disseminate health information to address the health issues among Internet-users. It is first place for them to visit and seek health information, which influence the health seeking behaviour of university students. Internet-users were reported to take better care of themselves to communicate with their health consultants. Certainly, they use Internet for health related matters and to seek variety of health information. Internet-users were also found to have constructive ideas about research and research-related activities and employed research approaches in their lives and consider that research is highly beneficial for them. They consider research would be helpful for their future and improve the process and practice of education at any level. Internet-users recognize "Internet" is an integral part of the social fabric and it provides a major context in which personal, academic and research development is enacted. The results are in consonance with the findings of some of the researchers in the field as *Manoj & Bhattacharjee* (2013) revealed that the Internet use had generated a significant influence upon users in their

research and academic work. Results further revealed that university students had claimed the Internet as a great tool for obtaining to the needed information for academics and research. *Sampath & Manjunath* (2013) exposed that university students used Internet service to support their study and research. They also showed that Internet use has improved their academic performance. *Chongtham & Nil Ratan* (2012) revealed that the Internet use had affected the research and academic work of university students. They acknowledged the Internet as a significant medium for gathering relevant knowledge and information for their academic and research work. *Carrick-Davies* (2011) reported those who have a familiarity with the Internet leverage this to benefit their career. *Venable* (2010) reported that the Internet provides an important medium for the delivery of career support. This career support might be concerned with the development of digital career literacy. *Mitchell et al.* (2009) revealed that the Internet has been acknowledged as a valuable means of health promotion; with information in web spread throw static health educational sites, peer support groups, online health consultations and delivery of Internet interventions. *Kamba* (2008) revealed that the only way to pursue knowledge is through research and the Internet is having a profound impact on the research process. *Pollard* (2007) reported that Internet can be used as a means to both acquire and share health information with the advantage of the user being able to maintain anonymity. It can help users to prepare for medical consultations and in making decisions regarding treatment options. *Adegboji & Toyo* (2006) reported that Internet contributed significantly to the ease of research through downloading materials. Further reported that higher education students used Internet for course related research. *Rajeev & Amritpal* (2006) made known that majority of university students were used the Internet for educational and for research purpose and least number of students used the Internet for entertainment aims. *Yusuf* (2006) exposed that the Internet provides wide range opportunities for easy access of relevant and current literature, wide range of instruments, online opportunity for validation of instrument, simulation of an on-going research, and so on.

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